

# Competence by Design (CBD) Implementation Pulse Check

CBD Program Evaluation Operations Team  
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# Executive Summary

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## Introduction

This report outlines the findings of a study conducted by the Royal College to understand how CBD implementation is going on the ground, as well as benefits, challenges, advice for moving forward, and any early outcomes. This study primarily examines fidelity of implementation, which is the extent to which critical components of CBD are present in a program, and also touches on integrity of implementation (the extent to which a program embodies the qualities of CBD that will lead to desired outcomes over time), and early outcomes. Information gathered in this study will allow for the monitoring of trends in CBD implementation over time, and ensure lessons learned and necessary adjustments are systematically incorporated into subsequent cohorts implementing CBD.

This study involved a survey to measure a program's overall implementation, implementation of key features of CBD, type and topics of faculty development, and benefits, challenges, and advice for moving forward. A subset of respondents participated in a follow up interview to delve more deeply into their experience. This study focused on the 2017 and 2018 CBD launch disciplines. 30.5% of programs participated in the survey, and 30% of those programs participated in an interview.

## Key Findings

### Overall Implementation and Key Features of Implementation

Respondents rated their overall CBD implementation an average of 3.31 out of 5. When asked about specific features of CBD implementation, most programs were on their way to full implementation. Of these features; very few features had any programs that had not yet started to implement them. Competence Committees were implemented most fully, whereas many respondents had not yet fully implemented individualized resident stage based learning.

### Faculty Development

The most common faculty development methods were grand rounds, emails, and workshops. Respondents felt that on the ground, hands-on faculty development was very effective. Faculty development topics included "What is CBD" and the how-to for on the ground work. Respondents felt that faculty received information well when it was delivered in bite sized pieces.

### Challenges and Benefits

The most common challenges participants faced were the time required to prepare for CBD and to complete EPAs, difficulty observing EPAs and the amount of EPAs, culture change of faculty and residents, and the functionality of electronic platforms.

The most common benefits participants found were residents receiving more frequent and better feedback, a more objective review of residents, catching struggling residents earlier, and better engagement of residents and faculty.

## Key Takeaways and Recommendations

Many programs that responded are in the midst of fully implementing CBD; most programs had at least begun to implement most, if not all, key features of CBD. This suggests that many programs have critical features of CBD present in their program, even if they are still working towards full implementation, and are adhering to the fidelity of CBD.

Integrity of implementation is about the culture shift to a growth mind set. Many programs see this culture shift as an important part of CBD, and appear to be working towards a culture shift. However, for many programs, the culture shift is still a work in progress.

This study did find some early outcomes, both positive and negative. It will be important to monitor these outcomes, especially the negative outcomes, and implement changes where needed to ensure CBD is achieving its intended outcomes and not having a detrimental effect.

Based on the findings in this study, some key recommendations were created.

**Provide clear, easy to access information and resources for programs.** Programs should be able to easily access resources and information they need to answer their questions and to implement CBD. If resources do not exist in areas where programs are struggling, they should be created.

**Encourage and facilitate the sharing of best practices.** Each program has unique innovations for implementing CBD in their context; successful innovations should be shared so programs can learn from each other.

**Learn from past challenges.** Challenges arise in these studies, and it is important to take this knowledge and ensure these challenges are not repeated in future implementation cohorts.

**Share information and early outcomes of CBD, and monitor negative outcomes.** Information on the rationale for why residency education is changing to CBD, and any early outcomes, should be shared to increase understanding and encourage a culture change. Any negative outcomes should be monitored, and adaptations made to counteract these negative outcomes.

**Improve electronic platforms.** Programs faced challenges with the functionality of various electronic platforms. These challenges should be noted, and, as much as possible, improvements made.

# CBD Pulse Check Report

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## Background

Competence by Design (CBD) is the Royal College of Physicians and Surgeons of Canada's major change initiative to reform the training of medical specialists in Canada. It is based on a global movement known as Competency Based Medical Education (CBME), and is led by the medical education community. The objective of CBD is to ensure physicians graduate with the competencies required to meet local health needs, and it aims to enhance patient care by improving learning and assessment in residency. It will eventually be implemented across the continuum from residency to retirement.

In CBD, progression of competence occurs within a structured but flexible curriculum consisting of five core components (Appendix A). More specifically, in a competency-based approach, competencies required for practice form a **framework** and are accordingly organized into a **progressive sequence**. Promoting resident progression forms the basis for the design of all curricular elements: **learning experiences that are tailored** to the acquisition of competencies, **instruction that is competency-focused** and **assessment that is programmatic** in approach (Van Melle et al., 2019). For more information on CBD, please visit the [Royal College website](#).

CBD is being implemented across the system of specialty medicine in Canada in stages. On July 1<sup>st</sup> each year, additional disciplines implement CBD. As of July 1<sup>st</sup>, 2018, 8 disciplines had launched CBD – these disciplines are the focus of this study.

## CBD Program Evaluation

The purpose of this study is to contribute to the longitudinal program evaluation of CBD. CBD is a complex initiative and the program evaluation will require a systematic, longitudinal approach that continuously monitors implementation, challenges, and opportunities for improvement. Many projects will be undertaken over the course of the evaluation.

The program evaluation will help to answer specific questions about CBD for the purpose of decision making, including if CBD is being implemented as intended, identifying areas for improvement and understanding program impacts (Van Melle, Frank, Brzezina, & Gorman, 2017).

The CBD program evaluation has three goals, each of which is addressed by a pillar of the evaluation.

### 1. To foster successful implementation of CBD.

It is important to understand what factors influence a successful implementation (Durlak & DuPre, 2008). This goal will be addressed by the readiness to implement pillar. Readiness to implement

examines an organization’s resolve (beliefs, attitudes, and intentions) and capacity (capabilities, resources, structure) to implement CBD (Scaccia, 2016).

**2. To understand the influence of local contexts, adaptations and innovations.**

Local sites will adapt CBD to fit their local context, and it is important to understand these adaptations to determine if there is a point where they compromise the fundamental principles of CBD. Without understanding this, we cannot determine if a lack of impact is from poor implementation or inadequacies in program theory (Palacios et al., 2016). This goal will be addressed by examining fidelity of implementation (the extent to which critical components of CBD are present in the program) (Century, Rudnick, & Freeman, 2010) and integrity of implementation (the extent to which the program embodies the qualities of CBD that will lead to desired outcomes over time) (Patton, 2016).

**3. To build an evidence base of the impact of CBD-Residency Education overtime.**

It is important to understand the impact of CBD, and what it is about CBD that works, for whom, in what circumstances, and why (Pawson et al., 2005). To meet this goal, short, medium, and long-term, as well as unintended outcomes will be examined overtime.

For more information on the program evaluation initiative, please email [educationstrategy@royalcollege.ca](mailto:educationstrategy@royalcollege.ca).

## Focus

The Pulse Check was conducted to monitor the implementation of CBD across the system of specialty medicine in Canada. Results were used to explore the status of CBD implementation, to gain a better understanding of the challenges and opportunities for improvement in implementation, to examine early outcomes, and to gather advice for moving forward.

In relation to the Program Evaluation pillars, the Pulse Check will focus primarily on fidelity of implementation, and touch on integrity of implementation, by examining the degree to which key features of CBD are implemented, and how they have been implemented in programs. It will also examine early outcomes through current benefits and challenges in implementation.

The information gathered from this study will allow the monitoring of trends in CBD implementation across the system of specialty medicine in Canada overtime, and will ensure lessons learned and necessary adjustments are systematically incorporated into subsequent cohorts implementing CBD.

## Methods

Participants of this study were program directors or program CBME leads of the 2017 and 2018 CBD launch disciplines. Participants were contacted by email and asked to participate in an online survey, and were asked at the end of the survey if they would like to participate in a follow up interview. The survey response rate was 30.5% (n = 33), and 30% of survey respondents (n = 10) participated in a follow up interview (see Table 1). Interviews were spread out across programs and Faculties of Medicine for maximum representation.

Discipline	Survey response rate	Programs interviewed
Anesthesiology	59% (n = 10)	6% (n = 1)

Otolaryngology – Head and Neck Surgery	23% (n = 3)	15% (n = 2)
Emergency Medicine	36% (n = 5)	21% (n = 3)
Forensic Pathology	33% (n = 1)	33% (n = 1)
Medical Oncology	27% (n = 4)	13% (n = 2)
Nephrology	38% (n = 6)	0% (n = 0)
Surgical Foundations	24% (n = 4)	6% (n = 1)
Urology	0% (n = 0)	0% (n = 0)

Table 1. Survey and interview response rates by program.

## ONLINE SURVEY

In June 2019, Program Directors of the 2017 and 2018 CBD launch disciplines were sent an email requesting their participation in a brief online survey with the intent of obtaining an overall sense of how CBD implementation was going in their program (Appendix B). The survey was conducted through Survey Gizmo. The survey was open for 5 weeks, and participants received two reminder emails, the first at two weeks and the second at four weeks.

The survey was a four-part survey developed collaboratively by the CBD Program Evaluation Operations team (Appendix E) consistent with the overall objectives above. The survey was developed through an iterative approach and was ultimately piloted on a representative sample using the Think Aloud protocol. Recommendations gathered from the pilot were assembled and incorporated into the final survey (Appendix B).

Part one of the survey asked respondents to subjectively rate how CBD implementation had gone for their program until that point on a scale from one to five.

The second part of the survey specifically addressed the implementation of the key components of CBD. An innovation configuration map approach was utilized to identify not only the key components of CBD, but also as a means of defining what those key components would look like when they had been fully implemented (Richardson, 2004). Innovation configuration mapping is particularly useful in making clear what a new program such as CBD (the innovation) is, and what it is not (Richardson, 2004). For each of the key components, a scale of one to five was utilized that characterized the component from non-implementation to ideal implementation respectively. While innovation configuration maps can be used for multiple purposes, in this case respondents use it as a form of self-evaluation that assessed degree of implementation (Richardson, 2004).

Part three of the survey addressed faculty development as it related to CBD. Respondents were asked about what topics had been provided to faculty, how those topics had been delivered, and what resources had been used.

Finally, in part four of the survey, free text boxes were used to explore the benefits of CBD implementation, the challenges of implementation, and ways that those challenges had been overcome.



## INTERVIEWS

At the conclusion of the survey, respondents were asked if they were interested in participating in a follow-up interview to delve more deeply into their experience with CBD thus far. A complementary interview guide (Appendix C) was assembled that consisted of twelve primary questions and associated prompts. Questions addressed themes similar to the survey including implementation and faculty development, but put additional focus on the benefits, challenges, and associated recommendations that respondents had compiled based on their experience with CBD. This guide was similarly created through an iterative approach by the CBD Program Evaluation Operations team.

Those who agreed to participate in an interview were contacted and polled for their availability. The interviews typically lasted between 30-45 minutes. One interviewer and one note-taker were present for most interviews. The interviewer was a member of the CBD Program Evaluation Operations team who is not directly involved in CBD implementation.

## Results

### Overall Implementation and Features of CBD

#### Key takeaways

- Respondents rated their overall implementation an average of 3.31 out of 5.
- When asked about specific features of CBD implementation, Competence Committees were implemented most fully, whereas many respondents had not fully implemented individualized resident stage based learning.

Participants were asked how their CBD implementation was going overall on a five-point scale; the average score was 3.31 (SD = .97). When asked how fully they had implemented CBD in interviews, most respondents indicated they had almost fully or fully implemented CBD. When probed, many programs had implemented all elements of CBD, but did still have room for development in some areas, such as culture change.

When asked in interviews what changes they had made to their program in implementing CBD, the most commonly cited changes were creating a curriculum map, revising the curriculum to implement EPAs, forming a Competence Committee, and implementing an electronic portfolio. This is in line with the highest scoring features on the survey.

Participants were asked the degree to which they had implemented key features of CBD on a five-point scale that ranged from non-implementation to full implementation. Average scores are provided in the graph below (Figure 1), in the order of degree of implementation.

There was no difference in average degree of implementation between disciplines that launched in 2017 and 2018. There was a positive correlation between scores on overall implementation and mean score on implementation of CBD features ( $r(32) = .693, p < .001$ ).

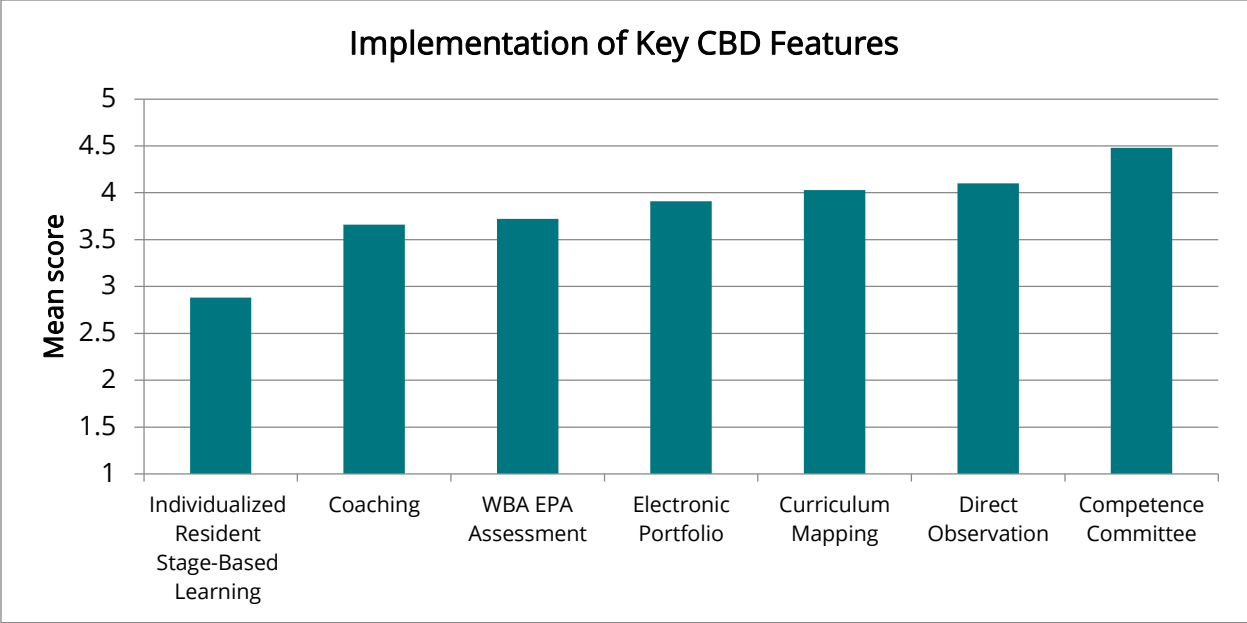


Figure 1. Average degree of implementation of key CBD features.

The key features of CBD and their level of implementation, based on innovation configuration mapping, is broken down in the graphs below. Scores range from non-implementation to fully implemented.

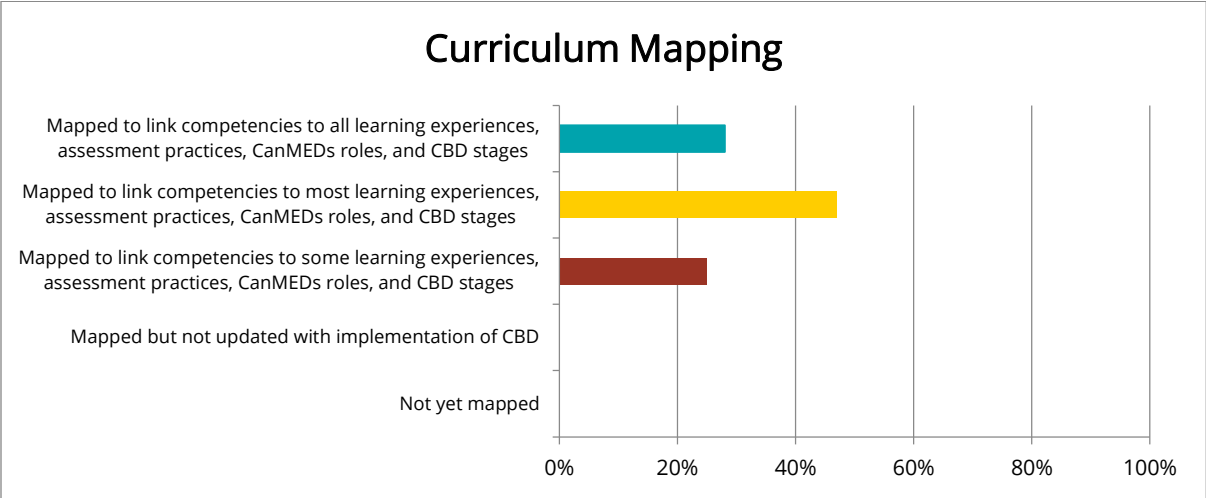


Figure 2. Curriculum Mapping responses.

All programs had at least created a curriculum map to link competencies to **some** learning experiences, assessment practices, CanMEDs roles, and CBD stages, if not all. Programs are progressing towards full implementation of curriculum maps.

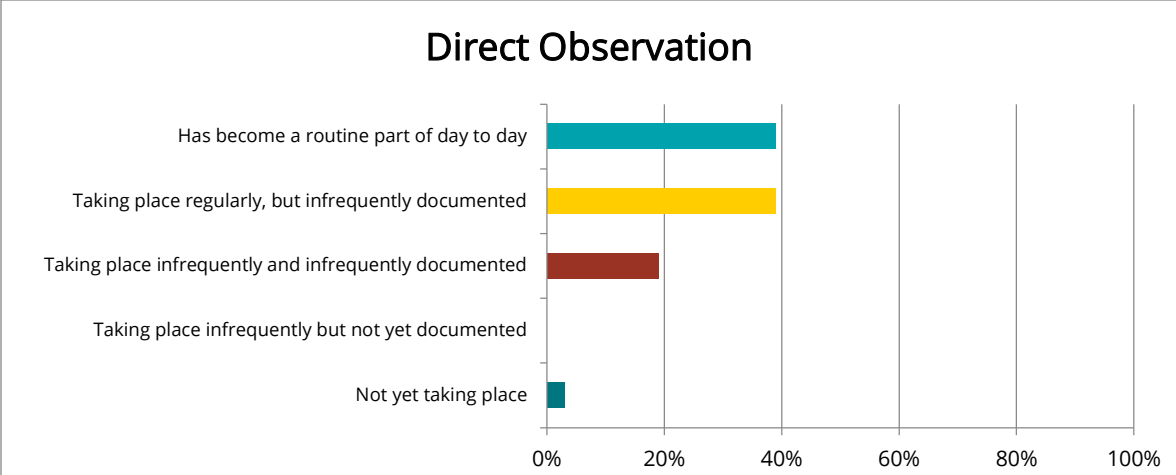


Figure 3. Direct observation responses.

The majority of programs had started, or are fully engaging in, direct observation of residents. However, many programs are infrequently documenting their direct observation; only 39% of programs had direct observation **and** documentation as part of their routine, day to day work. Most programs are progressing towards full implementation of direct observation; few programs have not yet started.

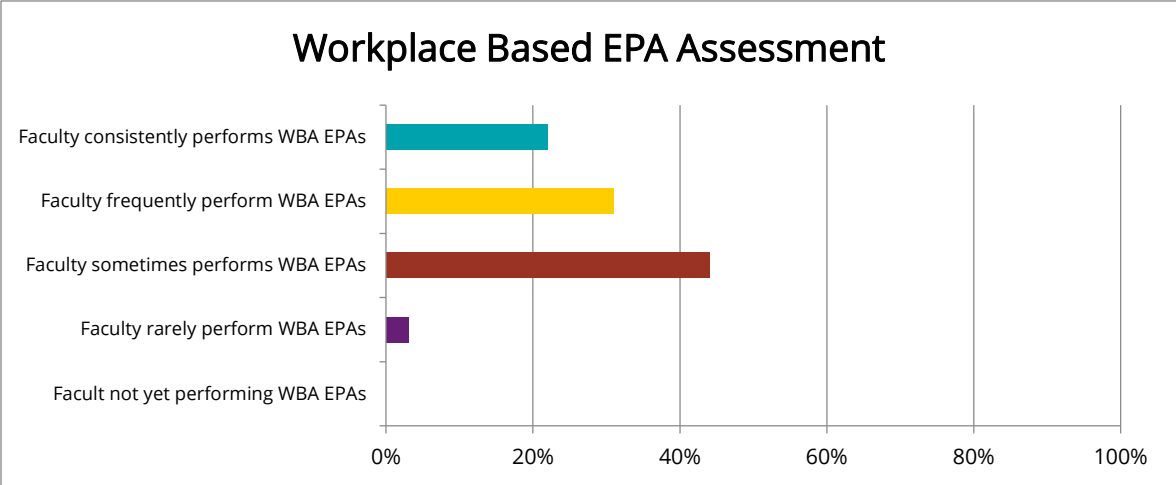


Figure 4. Workplace Based EPA Assessment responses.

Faculty were most likely to sometimes perform workplace-based EPA assessment, although many programs also had faculty frequently and consistently performing workplace-based EPA assessment. Only 3% of programs were rarely performing workplace-based EPA assessments. Programs are progressing towards full implementation of workplace-based EPA assessments; however, some programs may still need development in this area.

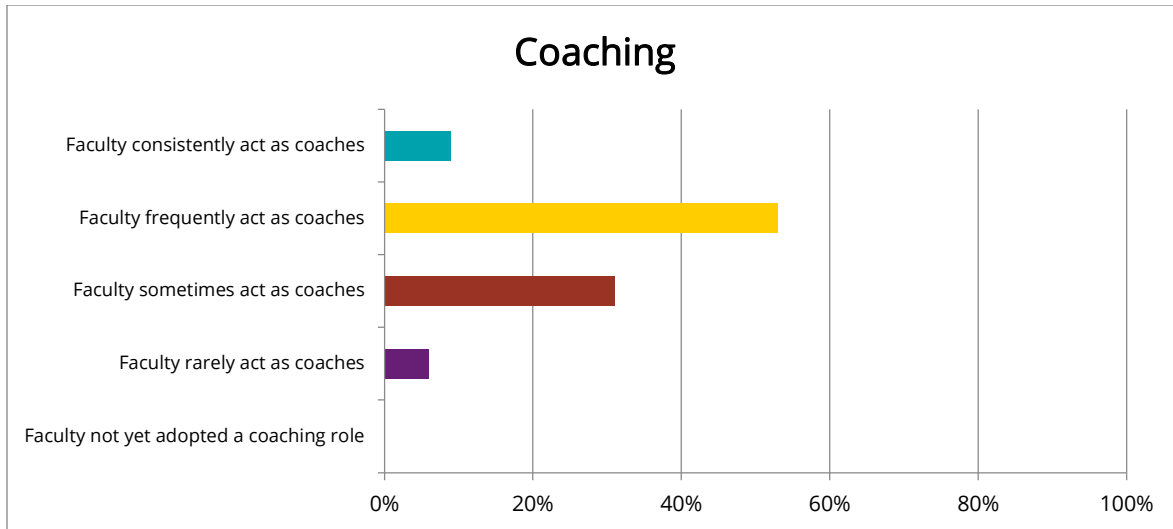


Figure 5. Coaching responses.

Programs were most likely to have faculty frequently or sometimes acting as coaches. Few programs had faculty consistently acting as coaches (9%) or rarely acting as coaching (6%). Programs are progressing towards full implementation, but few programs have fully implemented coaching at this time.

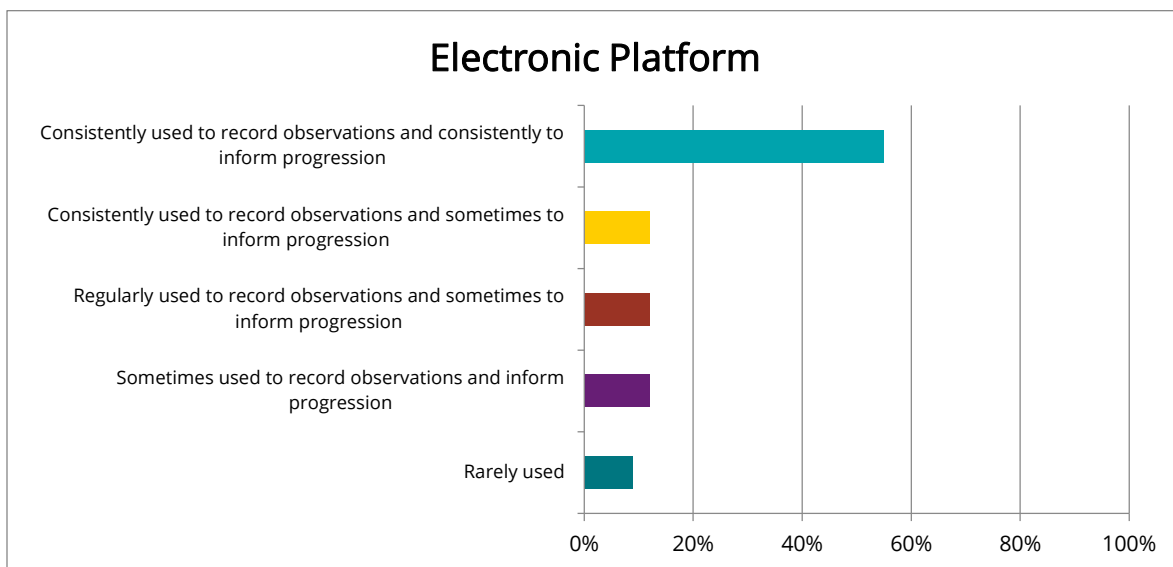


Figure 6. Electronic Platform responses.

The majority of programs are consistently using an electronic platform to record observations and inform resident progression decision making. This suggests that the electronic platform is a key feature that many programs have fully implemented in CBD.

However, 19% of programs were not yet using, or only sometimes using electronic portfolios. There are some programs that still need development in this key feature. Electronic portfolios did have some challenges associated with them; is it possible that these programs are struggling to overcome these challenges.

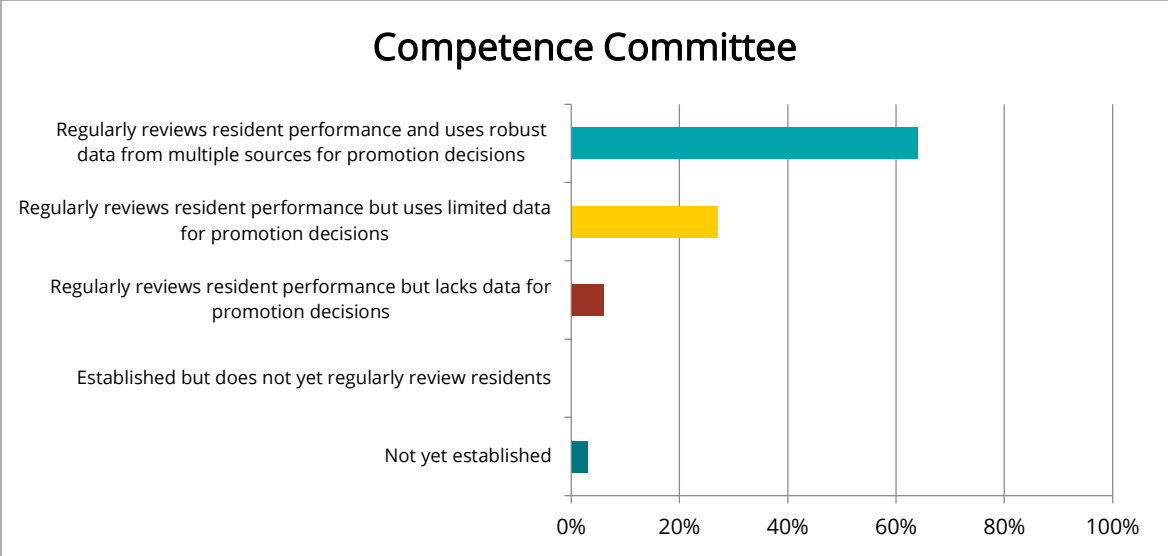


Figure 7. Competence Committee responses.

The majority of programs have a competence committee that regularly reviews resident performance and uses either limited or robust data to make promotion decisions. This suggests that Competence Committees are another key feature that many programs have fully implemented in CBD.

This is consistent with the benefits cited for CBD; many programs cited that their Competence Committee was running smoothly and was providing a benefit to their program.

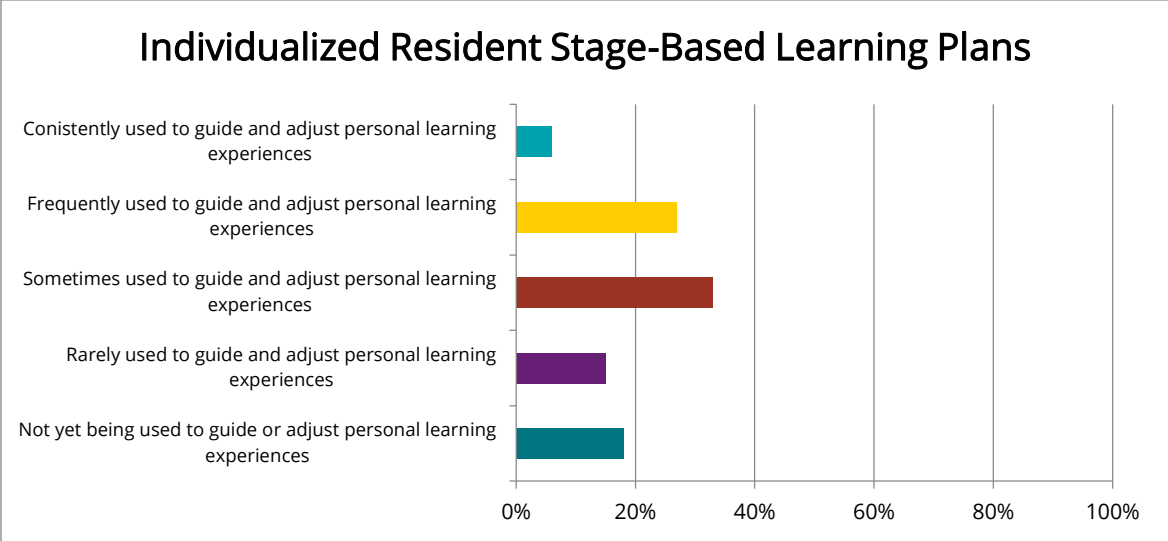


Figure 8. Individualized resident stage-based learning plans responses.

Scores on individualized resident stage-based learning plans were quite varied, with the majority of programs (60%) sometimes or frequently using learning plans to guide and adjust personal learning experiences. However, 33% of programs were rarely or not yet using personal learning plans, and only 6% were consistently using them. This suggests that more attention and clarification may be needed for this particular feature.

## Tips and Tricks

Interview participants shared some tips on how they made their implementation go more smoothly.

- Start early! This makes the change manageable and not so overwhelming.
  - Prepare before, not during.
- Understand that change is a process.

## Faculty Development and Resources

### Key takeaways

- Faculty development topics focused on “What is CBD” and the how-to for on the ground work. This information was primarily delivered by grand rounds, emails, and workshops.
- Most respondents found their faculty development to be effective, and indicated that they would continue this development as CBD continues.
- Most respondents used resources from their local program and Faculty of Medicine, although many said Royal College information was helpful.

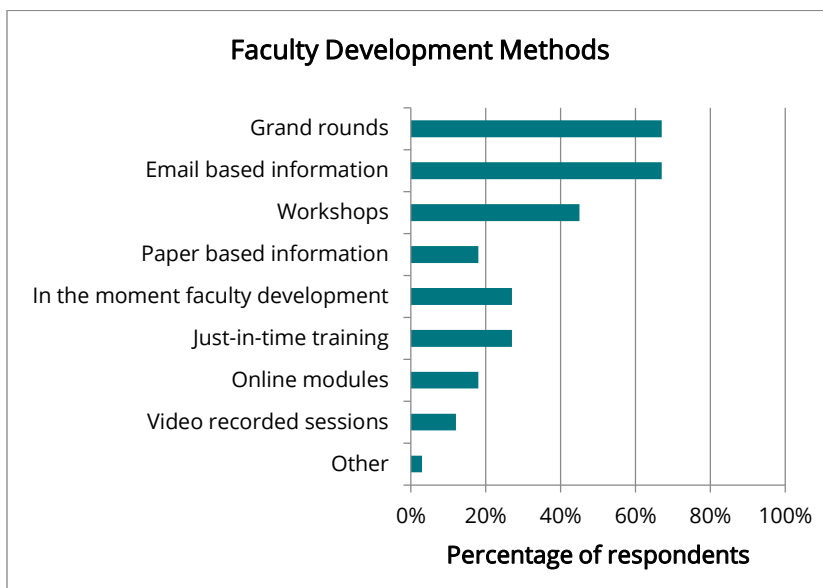


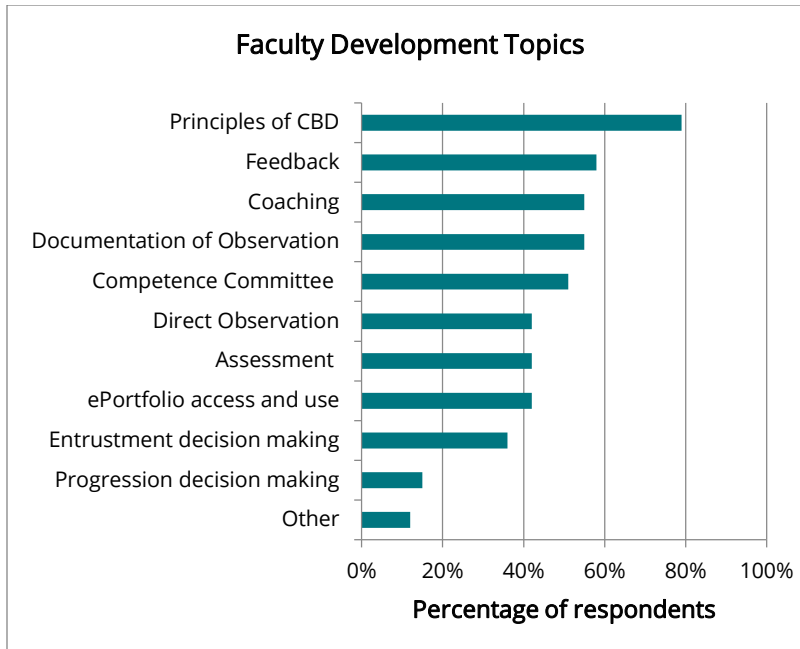
Figure 9. Usage of faculty development methods.

Participants were asked what faculty development methods they have used in the past 12 months. To deliver faculty development, most respondents used grand rounds, email based information, and workshops. Interview participants also frequently mentioned using presentations, talks, and workshops.

## Tips and Tricks

Interview participants shared some innovative faculty development and preparation ideas.

- Engage with staff on the ground with hands on, guiding activities.
- Have information, such as electronic platform logins and EPA numbers, readily available.
- Learn from those who have experience
  - Programs who have implemented CBD are now sharing their experience and knowledge with others who are preparing to implement.



The most common faculty development topics were the principles of CBD, and topics relating to the on the ground work of CBD (feedback, coaching, documentation, etc.) Interview participants cited the same topics when discussing how they prepared faculty and residents for CBD, but also emphasized electronic platform training.

Figure 10. Usage of faculty development topics.

Most programs found their preparation effective, and said they would continue with it.

The most common resources for faculty development were from the local program and/or local institution. Most programs found their PGME offices were supportive, and some had faculty development resources or sessions. However, some programs did find that while their PGME office was supportive, as these programs were one of the first to launch, their PGME office did not yet have fully developed resources. Many programs also had to create their own resources.

When probed about Royal College resources, many program directors said they found Royal College resources to be helpful, and used the information the Royal College provided (i.e., website, videos, etc.) to create their faculty development. However, they did find challenges with Royal College resources; for example, it was not suitable for their whole faculty (i.e., it could be more specialty specific, it was too difficult to get everyone in the same room to complete the training), or it was hard to navigate.

### Tips and Tricks

Many programs cited having additional support, such as a program CBD lead or coordinator, CBD champion, or administrative support, as integral. If possible, they suggest this to help implementation go more smoothly.

## Challenges and Benefits

### Key takeaways

- The most common challenges participants faced were about time (to prepare for CBD and to complete EPAs), EPAs (finding opportunities to complete them, amount of EPAs), faculty and resident culture change, and the electronic platform.
- The most common benefits were better and more frequent feedback, a more objective review of the resident, catching struggling residents earlier, and better engagement of residents and faculty.

## CHALLENGES

Participants were asked about challenges in both the survey and interview. While a variety of challenges were presented, there were some common challenges that many respondents raised.

**Time:** The time it took to prep for and implement CBD was seen to be a challenge, especially for program directors, who often took on the bulk of the work. Once CBD was launched, time to complete EPAs was a challenge for some, with some respondents citing evaluation fatigue and burnout. There is potential for patient flow to be affected by the increase in observation time.

**EPAs/Program Adjustments:** Challenges with EPAs included the number of EPAs and milestones, difficulty in observing EPAs or getting a sufficient number for promotion, and that sometimes EPAs imposed constraints on the residency curriculum. EPAs are updated as CBD implementation continues, and some respondents found that updates to EPAs were stressful, and the design and development of EPAs could have been better from the beginning.

Some solutions participants used to overcome these challenges were modifying rotations, completing less EPAs per clinic, using simulation to complete EPAs, and noting EPA challenges to bring to the attention of the specialty committee.

**Culture Change:** Culture change comes at different stages for different stakeholders; some are ready to change in the very beginning, and some change later, after the implementation of CBD has taken place.

At this point in the implementation process, culture change was a challenge, both for faculty and residents. This came up as a challenge in the survey, and interview participants were specifically probed for their faculty and residents' reaction. While faculty and residents' reactions were often mixed, many programs did face challenges with culture change.

**Faculty:** Respondents found that some faculty are not initiating EPAs or completing feedback and observations in a timely manner. Respondents also found that the quality of narrative feedback could be improved. Interview participants did often note that faculty are coming around to the change. However, many faculty seem to "accept" CBD, rather than embrace it, and are waiting for the culture to shift around them.

Off-service faculty in particular presented a challenge; respondents found it difficult to get off-service faculty involved, especially if they are part of a discipline that has not yet launched CBD. This is in line with data found in pre-launch studies; many programs pre-implementation had yet to engage off-service faculty. This is often challenging for residents, who feel like they have to push faculty to give observations and feedback.

**Residents:** Many programs found that some residents are not open to receiving feedback, and are uncomfortable receiving low scores on entrustment scales. Residents, especially those in a sub-specialty that were previously in a non-CBD specialty, feel like they are under a microscope with direct observation.

This led to programs often finding their residents "gaming the system", or only asking for EPA observations when they feel confident they will achieve a high score, rather than asking for EPAs when the opportunity arises and showing progression.



## Tips and Tricks

Respondents shared some tips to help with faculty culture change.

- Share information in small bits, so faculty can understand and digest it better.
- Use faculty and residents who have experienced the change to encourage and teach others.
- Use constant encouragement and teaching.
- Use awards to encourage participation.

**Electronic platform:** Respondents faced challenges with the usability of the electronic platform. Many found that it was difficult to organize data, and difficult to visualize and output data. This created problems for the Competence Committee, who had difficulty synthesizing data to make resident progression decisions.

Some respondents also indicated that they faced challenges when learning about the electronic platform, or transitioning to an electronic platform.

These challenges were felt throughout programs, regardless of if they used the Royal College ePortfolio or a separate system.

## BENEFITS

Participants were asked about benefits in both the survey and interview. Most of the benefits that respondents cited were around feedback and reviewing residents, but some respondents also found that faculty and residents were more engaged.

**Feedback and progression:** The most common benefit that respondents cited was that residents are receiving more feedback, and from this, there is more information and data available on residents. This data can be used to provide an overall picture of how residents are performing. This allows for an easier, more informed, and objective assessment of residents. More frequent feedback also allows residents to take action on this feedback – they receive this feedback while they are still in a relevant rotation, and can work to improve.

**Reviewing residents:** In a similar vein, respondents found that not only is it easier to get a picture of a resident's performance and provide an objective assessment, residents are being reviewed more often and more formally. The Competence Committee has also provided a benefit in terms of reviewing residents, as many people have eyes on the resident, and decision making power is spread over the group, rather than resting with the program director.

**Catching struggling residents sooner:** Programs found that as a result of the more frequent feedback and review, they were able to catch struggling residents sooner, and provide remediation. CBD allows residents more flexibility, and learning can be adjusted in order for residents to improve in areas they may be struggling in.

**Engagement:** Respondents found that faculty and learners were more engaged, and had improved interactions with each other. Although programs have been facing challenges with culture change, some faculty do see the benefit to CBD, and are engaged and enjoy forming a mentorship relationship with residents. Learners are engaged in their learning and progression, and the informed assessment can lead to individualized learning plans.

## Discussion and Recommendations

### Key takeaways

- Most programs seem on track to achieve fidelity of implementation; a change in culture is still a work in progress in many programs.
- Some early outcomes, both positive and negative, are seen through this study. These include better feedback and assessment, catching struggling residents earlier, better engagement, potential negative impacts to wellness and patient flow, and constraints on the curriculum. Negative outcomes will need to be monitored going forward.

This study was completed to monitor the implementation of CBD; it sought to examine fidelity and integrity of implementation, and determine any early outcomes of CBD.

### Fidelity and Integrity

Fidelity of implementation is the extent to which critical components of CBD are present in the program. Many programs that responded are in the midst of fully implementing CBD; many programs scored at the midpoint or above on their implementation of key CBD features, with very few features having any programs that had not yet started to implement that feature. This suggests that many programs have critical features of CBD present in their program, even if they are still working towards full implementation, and are adhering to the fidelity of CBD. Programs also indicate that a main topic of their faculty development is how to do the on-the-ground work of CBD; teaching faculty how to do CBD on the ground likely helps increase fidelity, because it gets everyone on the same page, and, if it continues, will likely help to continue increasing fidelity.

Integrity of implementation is the extent to which the program embodies the qualities of CBD; it is about the culture change to a growth mind set. This study focused mainly on fidelity, but some responses did touch on the culture change in CBD, especially in interviews. This change comes as the outcome of the effort to prepare for and operationalize CBD. Many programs appear to be working towards achieving the outcome of a culture change, and towards embracing a growth mind set. For example, many respondents felt that culture change was part of a full implementation of CBD, and benefits of CBD included more and better feedback for residents and more objective assessment. Programs also included the principles of CBD in their faculty development, to teach faculty why CBD is important. However, while many respondents felt these were important and were working towards a culture change in their programs, challenges show this may still be a work in progress. Some faculty and residents in each program have not yet experienced a change in culture, and are not fully engaged in CBD as this time. Some faculty do not provide feedback, or provide poor feedback, and some residents are struggling with achieving a growth mind set. For many programs, the culture change has not happened quite yet. People experience culture change at different rates, and at different points in implementation. It is likely that faculty and residents who are struggling are not yet experiencing this culture change.

## Early Outcomes

This study did find some early outcomes of CBD, stemming from the benefits and challenges programs reported. Early outcomes point to some positive and negative outcomes. It will be important to monitor the negative outcomes, and implement changes where needed to ensure CBD is achieving its intended outcomes and not having a detrimental effect.

Positive	Negative
<ul style="list-style-type: none"><li>Residents are receiving more feedback, and better feedback.<ul style="list-style-type: none"><li>Residents can take action on feedback.</li></ul></li><li>Residents are receiving more objective assessments, and being reviewed more often.</li><li>Struggling residents are identified sooner, and remediation plans implemented.</li><li>Faculty and residents are more engaged in the residents' learning, and have improved interactions, including forming a mentorship relationship.</li></ul>	<ul style="list-style-type: none"><li>The time it takes to implement and execute CBD can create evaluation fatigue and burnout.<ul style="list-style-type: none"><li>CBD may impact wellness.</li></ul></li><li>Time for direct observation may affect patient flow.</li><li>EPAs may impose constraints on the residency curriculum.</li></ul>

## Advice and Recommendations

Based on the data presented above, as well as advice respondents gave to the Royal College, some recommendations have been created. For more information on recommendations, and how relevant groups (i.e., Royal College, Faculties of Medicine, Specialty Committees, programs) can implement them, see Appendix D.

### Provide clear, easy to access information and resources for programs.

It is important that programs have access to the information and resources they need to successfully implement CBD. This will help programs find answers to their questions, and provide them with resources when teaching their faculty and residents about CBD. If they do not already exist, resources should be created to address elements of CBD that implementers are struggling with (e.g., individual learning plans, engaging off-service), and made readily available.

### Encourage and facilitate the sharing of best practices

Each program has unique innovations for how to best adapt CBD to their context, and some of these innovations may be applicable to challenges other programs are facing. Programs should have the opportunity to learn from each other and provide tips and tricks to address their challenges. For example, some programs have found innovative ways to engage faculty and change culture.

### Learn from past challenges

As CBD and the associated check-ins on implementation continue, challenges will arise. It is important to learn from these challenges and not repeat the same challenges in future implementation cohorts. For example, many programs are currently facing challenges with EPAs; these challenges should be noted so they are not repeated when future cohorts create EPAs. Learning should also be incorporated when revising already created content, such as EPAs.

### **Share information and early outcomes of CBD, and monitor negative outcomes**

Many programs indicated that it was hard to achieve culture change in their faculty when they do not have evidence for CBD. Change takes time, and the outcomes of CBD will not be available right away; CBD needs to be implemented before outcomes will materialize. To encourage culture change, it is important to share the rationale for the change to CBD, and for stakeholders to understand how CBD will address current challenges in medical education. Early outcomes should also be shared to encourage a culture change.

The monitoring of outcomes should continue as CBD implementation occurs, and outcomes should be explicitly studied. This will ensure CBD is being implemented as intended, and is not having any negative consequences. Any negative outcomes, such as the ones found in the study, should be monitored, and adaptations should be made to CBD as needed to counteract these negative outcomes.

### **Improve electronic platforms**

Respondents faced challenges with electronic platforms, regardless of if they were using the Royal College ePortfolio or a different system. Common challenges included user friendliness, data organization, visualization, and output. As much as possible, improvements should be made to these electronic platforms.

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## Appendix A

CBME Core Component	CBD-RE Program Model – Main Features
<p><b>COMPETENCY FRAMEWORK</b></p> <p>Competencies required for practice are clearly articulated</p>	<ul style="list-style-type: none"> <li>Competencies and outcomes are aligned with societal needs and are <b>socially accountable</b></li> <li><b>CanMEDS 2015</b> and discipline-specific competencies form the framework for aligning specialty training with competencies required for practice</li> </ul>
<p><b>SEQUENCED PROGRESSION</b></p> <p>Competencies and their developmental markers are sequenced progressively</p>	<ul style="list-style-type: none"> <li>Discipline specific <b>Entrustable Professional Activities (EPAs)</b> and associated milestones provide discrete markers of competence</li> <li>Discipline specific EPAs are organized into the <b>CBD Competence Continuum</b> to reflect how distinct, yet integrated stages of training are employed to support increasing progression towards readiness for practice</li> </ul>
<p><b>TAILORED EXPERIENCES</b></p> <p>Learning experiences facilitate the developmental acquisition of competencies</p>	<ul style="list-style-type: none"> <li><b>Learning experiences are based in authentic, work-based environments</b> that match the settings of future practice</li> <li><b>Learning experiences are organized</b> to acquire competencies and demonstrate EPAs</li> <li><b>A hybrid model</b> is used to organize learning experiences where time is still used as an organizing framework but there is flexibility in learner progression and acquisition of competencies</li> <li><b>Learners are motivated</b> to use competencies to guide and enhance their learning experience</li> </ul>
<p><b>COMPETENCY-FOCUSED INSTRUCTION</b></p> <p>Teaching practices facilitate the developmental acquisition of competencies</p>	<ul style="list-style-type: none"> <li>Learning is guided by <b>real-time, high quality feedback</b> from multiple observations</li> <li><b>EPAs are used to structure learning and focus instruction</b></li> <li><b>Teachers act as coaches</b> for the purpose of improvement, with repeated focused observation and feedback</li> </ul>
<p><b>PROGRAMMATIC ASSESSMENT</b></p> <p>Assessment practices support and document facilitate the developmental acquisition of competencies</p>	<ul style="list-style-type: none"> <li><b>Assessment is used for learning</b> through competency-based assessment focused on observations of EPAs in the workplace</li> <li><b>Assessment is used for progression</b> by linking promotion decisions and certification with successful completion of EPAs and progression through stages of training</li> <li>A <b>Competence Committee is responsible for regular review</b> of learner progress using highly integrative data from multiple EPA and milestone observations and feedback in clinical practice</li> <li>Changes to the <b>certification examination</b> to ensure entry to the Royal College examinations is <b>aligned with promotion decisions</b> entrusted to the Competence Committees Examinations will be maintained, but the timing and emphasis of such examinations will shift to occur earlier in training to promote a smoother transition to practice</li> <li>An <b>electronic portfolio is used to demonstrate and record</b> developments in competence and independence</li> </ul>

# Appendix B

## Pulse Check Survey

### Part 1 - Demographics

Please select your specialty/subspecialty:

- Anesthesiology
- Otolaryngology – Head and Neck Surgery
- Emergency Medicine
- Forensic Pathology
- Medical Oncology
- Nephrology
- Surgical Foundations
- Urology

Please select your institution

- University of British Columbia
- University of Alberta
- University of Calgary
- University of Manitoba
- University of Saskatchewan
- Western University
- McMaster University
- University of Toronto
- Queen’s University
- University of Ottawa
- Northern Ontario School of Medicine
- McGill University
- Université de Sherbrooke
- Université de Montréal
- Université Laval
- Dalhousie University
- Memorial University of Newfoundland

How long has it been since your program **locally** launched CBD?

- <6 months
- 6 months to 1 year
- 1 to 2 years
- 2 to 3 years
- 3 to 4 years

Your role (Please note that only a single respondent for each program is asked to complete this survey)

- Program Director
- Associate Program Director
- Program CBD Lead
- Other (please specify):

### Part 2 – CBD Implementation

Using the scale below, please indicate the position that best reflects your agreement with the following statement:

Overall, CBD implementation in my local program is going well.				
Strongly disagree				Strongly agree

### Part 3 – CBD Features of Implementation

Please choose your response based on the degree to which this activity is currently taking place in your program.

<b>Curriculum mapping</b> - A curriculum map is a tool that indicates how the components of a curriculum are related to one another. In the case of CBD, it links competencies to learning experiences, assessment tools, and CanMEDS roles throughout the stages of training (Ladhani & Writer, 2014).				
1	2	3	4	5
The curriculum has <b>not yet</b> been mapped.	The curriculum has been mapped, but not updated with the implementation of CBD.	The curriculum has been mapped to link competencies to <b>some</b> learning experiences, assessment practices, CanMEDs Roles, or CBD stages.	The curriculum has been mapped to link competencies to <b>most</b> learning experiences, assessment practices, CanMEDs roles, or CBD stages.	The curriculum has been mapped to link competencies to <b>all</b> learning experiences, assessment practices, CanMEDs roles, and CBD stages.

<b>Direct observation</b> – Direct observation takes place when supervisors purposefully observe residents while they perform patient care or clinical activities that are meaningful, realistic and authentic (Kogan, Hatala, Hauer & Holmboe, 2017).				
1	2	3	4	5



Direct observation of learners is <b>not yet</b> taking place.	Direct observation of learners is taking place <b>infrequently</b> , but is <b>not yet</b> documented.	Direct observation of learners is taking place <b>infrequently</b> and is <b>infrequently</b> documented.	Direct observation of learners is taking place <b>regularly</b> ; however, it is <b>infrequently documented</b> .	Direct observation and documentation of learner performance has become a <b>routine part</b> of day to day work.
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**Workplace-Based EPA Assessment** – Workplace-based assessment involves the documentation of an assessment of competence and the feedback generated by supervisors from authentic clinical observations for the purpose of trainee development and EPA achievement decisions. EPAs reflect the authentic work of physicians and provide explicit teaching, learning and assessment goals for residents (Gofton, Dudek, Barton & Bhanji, 2017).

1	2	3	4	5
Frontline faculty have <b>not yet</b> started to perform workplace-based EPA assessment.	Front line faculty <b>rarely</b> perform workplace-based EPA assessment.	Front line faculty <b>sometimes</b> perform workplace-based EPA assessment.	Front line faculty <b>frequently</b> perform workplace-based EPA assessment.	Front line faculty <b>consistently</b> perform workplace-based EPA assessment as a part of day to day work.

**Coaching** – In CBD, supervisors are encouraged to act as coaches. In this role, clinicians should provide residents with actionable feedback based on observation that is meant to guide them through a growth process resulting in performance enhancement. Coaching can occur in the moment as part of daily work, and over time (Royal College of Physicians and Surgeons of Canada, 2018).

1	2	3	4	5
Front line faculty have <b>not yet</b> adopted a coaching role with learners.	Front line faculty <b>rarely</b> act as coaches.	Front line faculty <b>sometimes</b> act as coaches.	Front line faculty <b>frequently</b> act as coaches.	Front line faculty <b>consistently</b> act as coaches.

**Electronic portfolio** – An electronic portfolio is a learning tool in CBD that allows for the electronic capture of observations, archiving of resident learning data, production of analytics and reports, and assessment of resident progression by competence committees (RCPSC,

2019b).				
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
An electronic portfolio is <b>not yet</b> being used to record resident observations.	An electronic portfolio is <b>sometimes</b> used to record resident observations and <b>sometimes</b> to inform resident progression decision making.	An electronic portfolio is <b>regularly</b> used to record resident observations and <b>sometimes</b> to inform resident progression decision making.	An electronic portfolio is <b>consistently</b> used to record resident observations, and <b>sometimes</b> to inform resident progression decision making.	An electronic portfolio is <b>consistently</b> used to record resident observations and to <b>consistently</b> inform resident progression decision making.

**Competence committee** – A competence committee makes formal resident promotion recommendations using data from multiple EPA and milestone observations, documented feedback from clinical practice and assessment sources such as examinations. A competence committee allows for an informed group decision-making process where patterns of performance can be collated to reveal a broad picture of a resident’s progression toward competence (RCPSC, 2019a).

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
A competence committee has <b>not yet</b> been established.	A competence committee has been established but does <b>not yet regularly review</b> resident performance.	A competence committee <b>regularly</b> reviews resident performance but <b>lacks data</b> to make promotion decisions.	The competence committee <b>regularly</b> reviews resident performance, but uses <b>limited data</b> for promotion decisions.	The competence committee <b>regularly</b> reviews resident performance, and uses <b>robust data collated from multiple sources</b> for promotion decisions.

**Individualized resident stage-based learning plans** – A developmental approach that recognizes that **all** residents can benefit from a documented individualized learning plan and stage-specific supports. These may include special mentors, readings or modified rotations to maximize growth and learning (RCPSC, 2019a)

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
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Individual resident learning plans are <b>not yet</b> being used to guide or adjust personal learning experiences.	Individual resident learning plans are <b>rarely</b> used to guide and adjust personal learning experiences.	Individual resident learning plans are <b>sometimes</b> used to guide and adjust personal learning experiences.	Individual resident learning plans are <b>frequently</b> used to guide and adjust personal learning experiences.	Individual resident learning plans are <b>consistently</b> used to guide and adjust personal learning experiences.
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#### Part 4: CBD Faculty Development

1. In the **last 12 months**, what faculty development topics have your **front line faculty** received? (check all that apply)
  - a. Principles of CBD
  - b. Direct observation
  - c. Documentation of observation
  - d. Assessment
  - e. Coaching
  - f. Feedback
  - g. Entrustment decision making
  - h. Competence committee development
  - i. Progression decision making
  - j. ePortfolio access and use
  - k. Other (please specify)
  
2. In **the last 12 months**, what **methods** have been used to deliver this faculty development? (check all that apply)
  - a. Workshops
  - b. Online modules
  - c. Video recorded sessions
  - d. Just-in-time training (workplace-based)
  - e. Grand rounds
  - f. Email based information
  - g. Paper-based information
  - h. In the moment faculty development
  - i. Other (please specify)
  
3. In **the last 12 months**, of the following sources of faculty development resources, please rank the **sources** in terms of **most frequently used**.
  - a. Royal college

- b. Local faculty of medicine
- c. Your own local program/department
- d. Other

**Part 5: Benefits and challenges**

**Question 5a** - Briefly describe the **challenges** you have encountered to date with CBD implementation:

**Question 5b** - Briefly describe what you have done to **overcome the challenges** you have encountered?

**Question 6** - Briefly describe the **benefits** you have encountered with CBD implementation so far in your program:

**Question 7** - What, if anything, could the Royal College do better to support you?

**Question 8** - Please share any other comments you might have:

Thank you for taking the time to fill out your survey! Pending your availability, we may follow-up with you via a brief telephone interview to delve more deeply into your experiences with CBD implementation thus far.

# Appendix C

## Pulse Check Interview Guide

### Introduction

This interview is a follow-up to the Pulse Survey recently conducted. The Royal College is interested in further understanding your experience with implementing CBD to date, what is working well, any challenges that you are encountering and any suggestions you have for improvement. In analyzing the data we will be focusing on the identifying themes; it will not be possible to identify individual program responses. This interview should take no longer than 30-45 minutes. Do you have any questions before we begin?

**Have you (or your predecessors) had experience with making a big change in your residency program in the past?**

- What were some barriers to this change?
- What helped you succeed?

### Questions:

**We are interested in details of your implementation. More specifically,**

1. In implementing CBD, what program changes have you made to date?
  - Is there anything you did during implementation that you think helped implementation go more smoothly? Could be an adaptation, etc.
2. In your opinion, how fully has your program implemented CBD?
  - How do you personally measure implementation?
  - What does fully implemented mean?
  - What is your expectation for full implementation?
3. Did you do anything specific to prepare your teachers and learners for the implementation of CBD? If yes, what did you do and who was involved?
  - Was this preparation effective? Why or why not?

**Now we would like to turn to understanding your experience to date.**

4. What is working well?
5. What challenges have you encountered?
  - Have you experienced residents “gaming the system”?
6. Have you experienced any surprises or unanticipated consequences as a result of CBD implementation? (i.e., Things you didn’t expect to see but are experiencing either positive or negative in nature)
7. What has the response been from your:

- Teachers?
- Learners?

8. Do you think your teachers and learners have been adequately informed and convinced of the need to change?

- Why or why not?

9. What resources and/or supports did you have in place to help with implementation?

- Were these adequate?
- If not, what resources or supports would have helped increase your readiness? (Probe for RC supports, PG office or program supports)
  - Do you find the Royal College supports helpful?

**Finally, we would like your advice on moving forward.**

10. Is there anything that the RC should be doing to assist specifically with your specialty program implementation moving forward?

11. Based on your experience to date what would you recommend to another Program Director to prepare for implementation?

- Do you have any tips or tricks to offer?

12. What advice would you give to the Royal College for future cohort preparation?

**Is there anything else that we have not covered that is important to know at this point?**

## Appendix D

### Recommendations and Advice

Recommendation	Action			
	Royal College	Postgraduate Office	Specialty Committee	Program
<b>Provide clear, easy to access resources</b>	Provide easy to access information on elements of CBD that programs are struggling with (i.e., individualized resident stage-based learning plans, engaging off-service). Ensure resources and information is easily accessible. Ensure resources are tailored to target audience (for example, specialty specific, easy to distribute to large groups).	Provide programs with resources on implementing CBD, and make sure resources are fully developed. Make it clear where programs can find these resources. Continuously communicate with programs on their resource needs.		
<b>Encourage and facilitate sharing of best practices</b>	Facilitate sharing at the national level. The Royal College has recently implemented a group called the CBD Innovators to share their stories, and tips and tricks from program evaluation studies will also be shared. This work should continue, and information should be easily accessible to programs.	Facilitate sharing at the Faculty of Medicine level. Many institutions are already doing this; programs that have implemented are giving talks and advice to programs preparing to implement. This should continue, and institutions not doing this should consider facilitating sharing.	Facilitate sharing at the specialty level. Regular check-ins on implementation should be a standing item at Specialty Committee meetings, creating the opportunity for sharing of best practices and tips and tricks.	If programs feel they have best practices to share they are encouraged to reach out to any of the other groups to share.

<b>Learn from past challenges</b>	Continue check-ins on implementation and other program evaluation initiatives, and keep previous challenges in mind when creating new CBD content. Provide challenges to other groups that create CBD content, such as specialty committees. Use challenges to adjust CBD as needed. Use current challenges to anticipate future challenges in advance.	Collect data and reflect on current challenges and determine how to avoid them for future cohorts, and adjust them for current cohorts.	Have a process in place to receive feedback on CBD challenges, such as feedback on document suites. Revise document suites based on challenges. Specialty Committees creating new document suites for future cohorts should note past challenges and avoid them as much as possible.	Track challenges and report them to relevant groups.
Consider collecting national data to easily track challenges across specialties, institutions, and programs.				
<b>Continue to collect outcomes data, and monitor negative outcomes</b>	Continue to monitor outcomes, and create an explicit plan to study outcomes. The CBD Program Evaluation Operations team is currently working on a plan to measure and study the outcomes of CBD. Provide information on why CBD will address current challenges in medical education to encourage culture change. Share early outcomes. Monitor negative outcomes to ensure CBD is not having negative consequences.	Collect information on outcomes at the institution level, and monitor negative outcomes. Engage in program evaluation at the institutional level. Engage with the Royal College national program evaluation and share implementation and outcomes data.	Collect information on outcomes at the specialty level, and monitor negative outcomes. Engage in program evaluation at the specialty level. Engage with the Royal College national program evaluation and share implementation and outcomes data.	Collect information on outcomes at the program level, and monitor negative outcomes. Engage in program evaluation at the program level. Engage with the Royal College national program evaluation and share implementation and outcomes data.
<b>Improve electronic portfolios</b>	Engage programs using the Royal College ePortfolio to understand improvements needed.	If not using Royal College ePortfolio, discuss challenges with programs and, as much as possible, make relevant		Discuss with Royal College or postgraduate office electronic portfolio needs.



	Address improvements as much as possible; for example, better organization and data visualization.	improvements. If switching platforms, prepare programs in advance for the transition.		
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## Appendix E

### CBD Program Evaluation Operations Team

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